

Serial No.: 10/089,072
Atty. Docket No.: P67777US0

IN THE CLAIMS:

Please cancel claims 1-7, and add claims 8-27 as follows:

~~Claims~~ 1-7 (Canceled).

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8. (New) A torque-limiting coupling device comprising:

- a shaft having a shaft sleeve affixed thereon;
- an outer sleeve frictionally engaging said shaft sleeve for transmission of torque up to a preset limit, said outer sleeve rotating relative to said shaft when said torque exceeds said preset limit; and
- a pump mechanism, responsive to said outer sleeve rotating relative to said shaft, for pumping liquid to an interface between said shaft sleeve and an inner surface of said outer sleeve;

said shaft sleeve having a plasticizing limit which is lower than a plasticizing limit of said outer sleeve inner surface.

9. (New) The torque-limiting coupling device as set forth in claim 8, wherein said shaft sleeve is made of a tin-copper alloy.

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10. (New) The torque-limiting coupling device as set forth in claim 9, wherein said shaft sleeve has a thickness of about 5 mm.

B₁₄ 11. (New) The torque-limiting coupling device as set forth in claim 9, wherein said alloy has an elastic limit of about 100 N/m².

12. (New) The torque-limiting coupling device as set forth in claim 11, wherein said shaft sleeve has a thickness of about 5 mm.

13. (New) The torque-limiting coupling device as set forth in claim 8, wherein said shaft sleeve further includes cavities on an outer surface thereof which enable said shaft sleeve, upon plasticization thereof, to disengage from said inner surface of said outer sleeve.

14. (New) The torque-limiting coupling device as set forth in claim 13, wherein said cavities include grooves disposed around a circumference of said shaft sleeve.

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15. (New) The torque-limiting coupling device as set forth in claim 8, wherein said shaft sleeve is made of tombak and said inner surface of said outer sleeve is made of steel.

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16. (New) The torque-limiting coupling device as set forth in claim 8, wherein said shaft sleeve further includes cavities on an outer surface thereof which are dimensioned such that said shaft sleeve, upon plasticization thereof, has a radial thickness that is smaller than a radial distance between said shaft and said inner surface of said outer sleeve when said shaft and said outer sleeve have been radially relieved of load.

17. (New) The torque-limiting coupling device as set forth in claim 16, wherein said cavities include grooves disposed around a circumference of said shaft sleeve.

18. (New) The torque-limiting coupling device as set forth in claim 8, wherein said shaft sleeve is removable from said shaft for replacement thereof following plasticization.

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19. (New) A torque-limiting coupling device comprising:

a generally cylindrical shaft having a removable outer surface layer thereon, said outer surface layer having a first plasticizing limit;

B₁₄ a sleeve having a generally cylindrical inner surface which coacts with said outer surface layer, said inner surface having a second plasticizing limit higher than said first plasticizing limit, said sleeve inner surface being in frictional engagement with said shaft through said outer surface layer for transmission of torque up to a preset limit, said sleeve rotating relative to said shaft when said torque exceeds said preset limit; and

a pump mechanism, responsive to said sleeve rotating relative to said shaft, for pumping liquid to an interface between said outer surface layer and said inner surface to reduce friction therebetween;

said outer surface layer, responsive to said sleeve rotating relative to said shaft and said pump mechanism operating insufficiently to reduce said friction, undergoing plasticization to allow said sleeve to rotate free from contact with said shaft.

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20. (New) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer is made of a tin-copper alloy.

B₁₄ 21. (New) The torque-limiting coupling device as set forth in claim 20, wherein said outer surface layer has a thickness of about 5 mm.

22. (New) The torque-limiting coupling device as set forth in claim 20, wherein said alloy has an elastic limit of about 100 N/m².

23. (New) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer further includes cavities therein which enable said outer surface layer, upon plasticization thereof, to disengage from said inner surface of said outer sleeve.

24. (New) The torque-limiting coupling device as set forth in claim 23, wherein said cavities include grooves disposed around a circumference of said outer surface layer.

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25. (New) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer is made of tombak and said inner surface of said outer sleeve is made of steel.

B₁₄ 26. (New) The torque-limiting coupling device as set forth in claim 19, wherein said outer surface layer further includes cavities therein which are dimensioned such that said outer surface layer, upon plasticization thereof, has a radial thickness that is smaller than a radial distance between said shaft and said inner surface of said outer sleeve when said shaft and said outer sleeve have been radially relieved of load.

27. (New) The torque-limiting coupling device as set forth in claim 26, wherein said cavities include grooves disposed around a circumference of said outer surface layer.
